

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



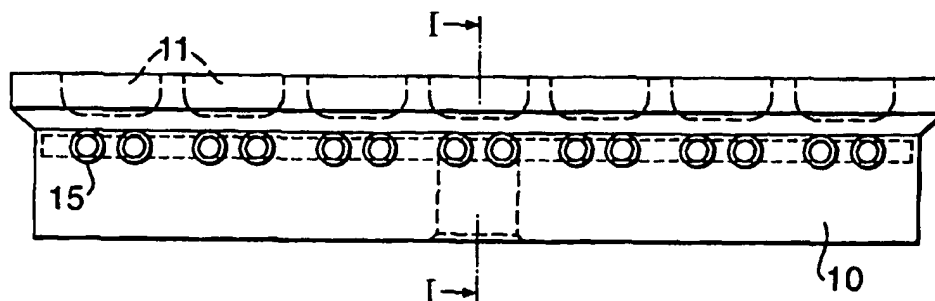
(43) International Publication Date
28 February 2002 (28.02.2002)

PCT

(10) International Publication Number
WO 02/16207 A1

- (51) International Patent Classification⁷: **B65B 47/02**
- (21) International Application Number: PCT/GB01/03826
- (22) International Filing Date: 23 August 2001 (23.08.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0020964.3 25 August 2000 (25.08.2000) GB
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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
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(54) Title: PROCESS AND MOULD FOR THERMOFORMING CONTAINERS



(57) Abstract: The present invention relates to a method of manufacturing water-soluble containers using a horizontal intermittent motion thermoforming machine which comprises the steps of: a) locating a first water-soluble film over a mould, said mould containing a plurality of pocket forming cavities, defined by side walls and a base, in a 2-dimensional array, each cavity being surrounded by a planar surface of the mould on all sides in which the shortest dimension of the planar surface between two adjacent cavities is at least 3 mm and between an edge of the mould and the closest cavity is at least 1.5 mm; b) thermoforming the first film to produce a plurality of pockets; c) at least partially filling the pockets with a composition; and d) sealing the plurality of the at least partially filled pockets. The cavities are positioned in the array such that there are a plurality of continuous strips of uninterrupted planar surface of the mould from a leading to a trailing edge of the mould, for receiving support means fitted to the machine for supporting the film.

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CLAIMS

1. A process for producing a water-soluble container
using a horizontal intermittent motion thermoforming
5 machine which comprises the steps of:
- a) locating a first water-soluble film over a mould,
said mould containing a plurality of pocket forming
cavities, defined by side walls and a base, in a 2-
10 dimensional array, each cavity being surrounded by a
planar surface of the mould on all sides in which
the shortest dimension of the planar surface
between two adjacent cavities is at least 3mm and
between an edge of the mould and the closest cavity
15 is at least 1.5mm;
 - b) thermoforming the first film to produce a
plurality of pockets;
 - 20 c) at least partially filling the pockets with a
composition; and
 - d) sealing the plurality of the at least partially
filled pockets,
 - 25 wherein the cavities are positioned in the array
such that there are a plurality of continuous strips of
uninterrupted planar surface of the mould from a leading
to a trailing edge of the mould, for receiving support
30 means fitted to the machine for supporting the film.
2. A process as claimed in claim 1 in which step d)
comprises placing a second water-soluble film on top of
the at least partially filled pockets and sealing the
35 films together.
3. A process as claimed in any one of the preceding
claims in which the water-soluble film is a poly (vinyl

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4. A process as claimed in any one of the preceding claims in which the depth of the cavities lies in the range of 10 to 80% of the shortest dimension of the mouth cavity.
- 5
5. A process as claimed in any one of the preceding claims in which the depth of the cavities lies in the range of 40 to 60% of the shortest dimension of the mouth cavity.
- 10
6. A process as claimed in any one of the preceding claims in which the cavity bases are planar.
- 15
7. A process as claimed in any one of claims 1 to 4 in which the cavity bases are rounded.
8. A process as claimed in claim 6 in which the rounded bases have a radius of 20mm.
- 20
9. A process as claimed in any one of the preceding claims in which corners formed where the cavity side walls meet each other are rounded.
- 25
10. A process as claimed in claim 9 in which the side wall corners have a radius of 10mm.
11. A process as claimed in any one of the preceding claims in which edges formed where the cavity side walls meet an upper surface of the mould are rounded.
- 30
12. A process as claimed in claim 11 in which the side wall-mould upper surface edges have a radius of 1mm.
- 35
13. A process as claimed in any one of the preceding claims in which bottom corners, formed where the cavity side walls meet the cavity base, are rounded.

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(Rest of 14 Missing In Delphi)

side wall-base bottom corners have a radius of 10mm.

- 5 15. A process as claimed in claim 13 or claim 14 in which air bores are located in the side wall base bottom corners.
16. A process as claimed in claim 15 in which the air bores have a diameter of 0.1mm to 1mm.
- 10 17. A process as claimed in claim 16 in which the air bores have a diameter of 0.4mm to 0.5mm.
- 15 18. A process as claimed in any one of the preceding claims in which the shortest dimension of the planar surface between two adjacent cavities lies in the range of 4mm to 10mm and between an edge of the mould and the closest cavity lies in the range of 2mm to 5mm.
- 20 19. A process as claimed in any one of the preceding claims in which a continuous strip of uninterrupted planar surface is provided between adjacent rows of cavities.
- 25 20. A process as claimed in any one of the preceding claims in which a continuous strip of uninterrupted planar surface is provided between every other pair of adjacent rows of cavities.
- 30 21. A mould for use in a thermoforming process for manufacturing water-soluble containers from water-soluble films, in which said mould contains a plurality of pocket forming cavities, defined by side walls and a base, in a 2-dimensional array, each cavity being surrounded by a planar surface of the mould on all sides in which the
- 35 shortest dimension of the planar surface between two adjacent cavities is at least 3mm and between an edge of the mould and the closest cavity is at least 1.5mm, and in which the cavities are positioned in the array such

uninterrupted planar surface of the mould from a leading to a trailing edge of the mould.

22. A mould as claimed in claim 21 in which the depth
5 of the cavities lies in the range of 10 to 80% of the shortest dimension of the cavity mouth.

23. A mould as claimed in claim 21 or 22 in which the
10 depth of the cavities lies in the range of 40 to 60% of the shortest dimension of the cavity mouth.

24. A mould as claimed in any one of claims 21 to 23 in which the cavity bases are planar.

15 25. A mould as claimed in any one of claims 21 to 24 in which the cavity bases are rounded.

26. A mould as claimed in claim 25 in which the rounded
20 bases have a radius of 20mm.

27. A mould as claimed in any one of claims 21 to 26 in which corners formed where the cavity side walls meet each other are rounded.

25 28. A mould as claimed in claim 27 in which the side wall corners have a radius of 10mm.

29. A mould as claimed in any one of claims 21 to 28 in which edges formed where the cavity side walls meet an
30 upper surface of the mould are rounded.

30. A mould as claimed in claim 29 in which the side wall-mould upper surface edges have a radius of 1mm.

35 31. A mould as claimed in any one of claims 21 to 30 in which bottom corners, formed where the cavity side walls meet the cavity base, are rounded.

32. A mould as claimed in claim 31 in which the side

wall-base bottom corners have a radius of 10mm.

5 33. A mould as claimed in claim 31 or claim 32 in which air bores are located in the side walls base bottom corners.

10 34. A mould as claimed in claim 33 in which the air bores have a diameter of 0.1mm to 1mm.

35. A mould as claimed in claim 34 in which the air bores have a diameter of 0.4mm to 0.5mm.

15 36. A mould as claimed in any one of claims 21 to 35 in which the shortest dimension of the planar surface between two adjacent cavities lies in the range of 4mm to 10mm and between an edge of the mould and the closest cavity lies in the range of 2mm to 5mm.

20 37. A mould as claimed in any one of claims 21 to 36 in which a continuous strip of uninterrupted planar surface is provided between adjacent rows of cavities.

25 38. A mould as claimed in any one of claims 21 to 37 in which a continuous strip of uninterrupted planar surface is provided between every other pair of adjacent rows of cavities.

30 39. A mould as claimed in any one of claims 21 to 38 in which air bores are located.

40. A container formed by the process of any one of the preceding claims.

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Fig.1.

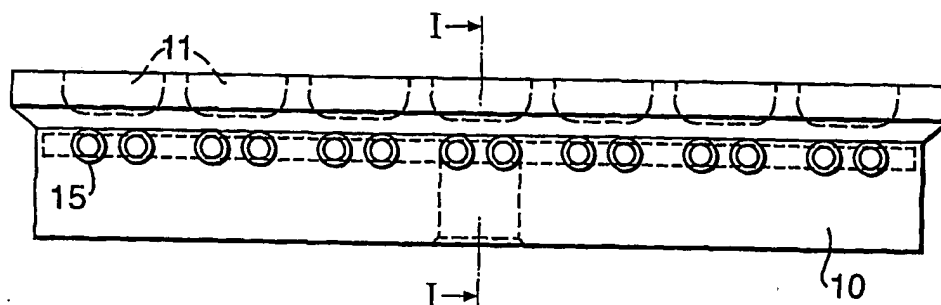
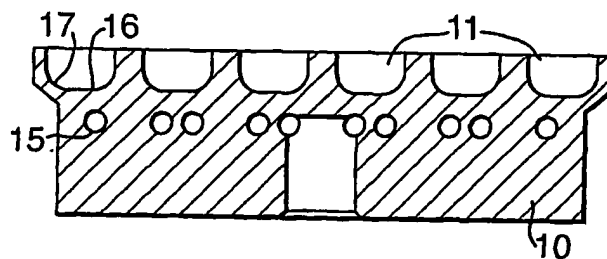


Fig.2.



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Fig.3.

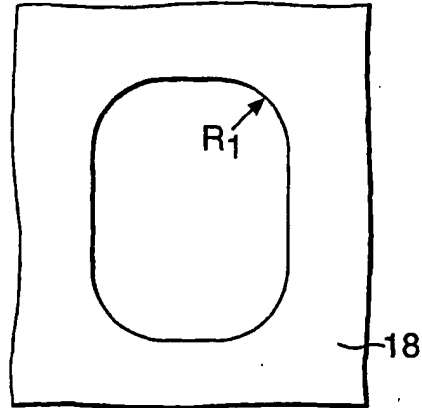


Fig.4.

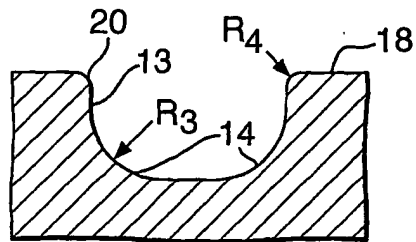


Fig.5.

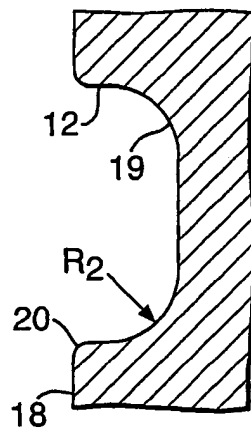


Fig.6.

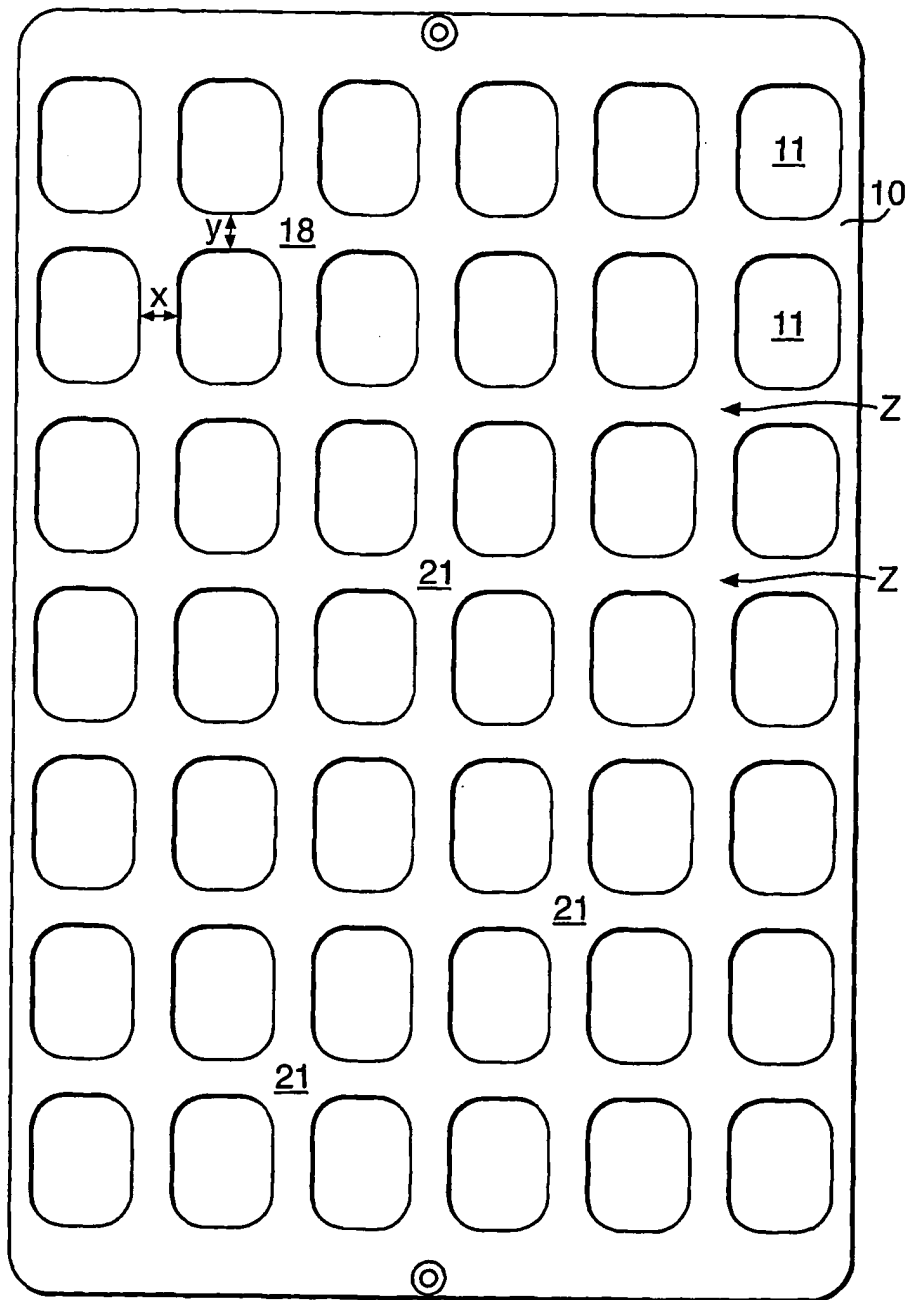


Fig.7.

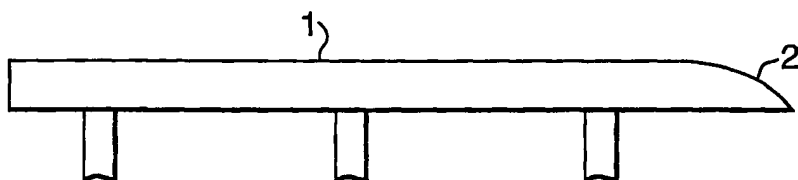


Fig.8.

